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AND

JOURNAL FOR RECORDING FACTS & ANECDOTES

RELATING TO

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AN ADDRESS delivered at the ANNIVERSARY MEETING of the ENTOMOLOGICAL SOCIETY OF LONDON, on Monday, January 22nd. By EDW. NEWMAN, President.

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Local Lists. By the Rev. W. H. HAWKER, M.A.

"Why sleeps he not when others are at rest?"

BYRON

SOME time ago a book was published by a nobleman, which one of the Reviews thus criticised, "'Things hoped for, by Viscount ***'—and by nobody else." I will not thus summarily deal with "Things hoped for, by John Scott, Esq.," which appeared in the 'Zoologist' for September last, but wish merely to make a few friendly suggestions thereupon.

To hope for a thing implies, at least in this case, that the thing hoped for does not exist. Now many of the things that Mr. Scott is hoping for have already entered upon their existence (for instance, local collections and lists, and popular lectures on Natural History), quietly, perhaps, and unobtrusively, but not the less really. Nothing in nature or science is born full grown, "*parva * * primo, vires adquirir eundo,*" and it would take away the chief charm of the study of Natural History, if, the moment we entered upon the zealous pursuit of any particular branch, everything connected with it were to burst upon one with a hop, skip and a jump, and a "here we are!" like the clown in a pantomime. Nature is a coy maiden, who will strongly resent any rough handling, and will only by degrees, in proportion as you cultivate her acquaintance, unfold all her charms to you: she is no coquette, and if she courts your attention it is more by her retiring modesty than by any meretricious display of her riches. I remember, when on the Continent, experiencing a feeling almost of disappointment at seeing Bath whites and Camberwell beauties flaunting about in such profusion, and felt almost inclined to say, "I am ashamed of you—I really thought better of you." The same feeling is expressed by a friend of mine, who, writing me a description of some of the New Zealand and Australian localities for ferns, says, "Ferns are really too numerous in New Zealand—they almost cease to be interesting from their vulgarity. In South Australia, for the same reason, *Adiantum* ceases to be lovely." I merely adduce these instances to show that it is the need of "patience and perseverance," and the *gradual* mastering of *difficult* passages, that renders the book of nature so interesting.

To return to the 'Things hoped for.' I find there a "desire and wish to see men spring up with minds so large as to compete with



those departed and on the wane." Mr. Scott is not the first person who, since the time of Cadmus, has wished to make men spring up ready armed from the ground. But who, I ask, are to be these universal regenerators of systems and nomenclatures? I myself do not despair of seeing men rise up who will possess the peculiar talent of grasping all the discoveries subsequent to the last generally received systems, and of reorganizing those systems; but you may depend upon it, that, as we are told that "great occasions make great men," so, when the proper time comes, the demand will, in this case, though it does not universally, create a supply; and, until that time comes, a set of mere collectors and observers of nature will no more be able to make themselves great by inventing a lot of fantastic names, than you would be able to keep them to any one system (and Mr. Scott says this is a "necessity") so long as you allow them to alter generic and specific names at pleasure.

"Not be tied by old names and defunct lists"! Why, where should we be without them? If it were not for the labours and lists of Linnæus and others, whose systems and names (and perhaps their *names* more than their systems) are European, where should we be now? How would you or I, when looking over some Continental collection, explain to the curator, Monsieur This or Herr That, that the garden white was a butterfly of by no means rare occurrence in one's native country? If the collection was so fortunate as to boast a specimen, one could of course point to it as a child or the learned pig would to "B was a Butterfly!" But suppose the specimen was wanting, how could you express yourself, unless you had the common ground of some universally received, though perhaps, in some respects, imperfect nomenclature? Those who come nearest to Linnæus and the ancients in science appear to be the most careful and jealous to avoid altering the existing nomenclatures.

Again, many of our most successful entomologists would, if left to name their captures themselves, make use of Her Majesty's English, which they understand, in preference to obsolete languages, of which they may chance to know but little. Then an insect might rejoice in as many aliases as a London pickpocket, or amongst birds that unfortunate Caprimulgus, and interchange of ideas and of specimens would be next to impossible. Thus we should have the same insect called, according to trivial association, "the neglected rustic" by one person, "the pale puss" by another, "the speckled footman" by a third, or perhaps, if taken near Manchester, "the clouded drab!" If

you forced the dead languages upon them it would be worse still. I was lately visiting the stove-houses of a nobleman who has one of the best collections of exotic orchids and ferns in this country, and whose gardener is most scientific and successful in their cultivation; but the poor man was terribly put to it with the labels, and had too often joined masculine and feminine, with a more correct idea of connubial than of grammatical harmony!

The greatest difficulty will hereafter arise in the way of forming correct lists of truly British insects, from the quantity of *bought* specimens and collections, which Mr. Scott so justly decries. Kirby says, "I have seldom seen a cabinet so meagre as not to possess some unique specimen." Now, alas! if one substituted the word "bought" for "unique," it would be nearer the truth. This evil should be taken in time, and might be counteracted by every *bona fide* collector, who wishes that science should benefit by his labours, keeping a careful catalogue containing the history of how each scarce insect came into his possession; and properly not a single specimen bought from a dealer should be admitted without some mark being adopted to note its antecedents.

The importance and value, therefore, of "Local Lists" cannot, in this respect, be overrated. But, at the same time, there is now a well-founded and natural aversion to publishing the exact localities and stations of rare things, from the unscrupulous way in which collectors, amateur as well as professional, too often eradicate, as far as lies in their power, any rare object. What writes a friend, a prominent entomologist, to me on my telling him of the discovery of a scarce insect? "Be sure you don't say anything about the locality to any one." One of the most distinguished botanists in England, on hearing of my finding a rare plant, writes, "I trust you will be very careful not to risk the extirpation of so truly interesting a species by making its station known to any of our collecting societies or their agents, or to any collector of plants for sale." Botany is more exposed than her sister sciences to this danger; and this has been the reason why communications to the 'Phytologist' were so much less numerous than those to the 'Zoologist;' not because Botany is less studied at present in Britain than Zoology, or that there is little left to discover and record, for one's own experience and that of one's friends convinces one of the contrary, but that when one finds new stations for rare plants, or good botanical localities, one is shy of publishing them; as, the more choice the plants, the more certain it is that the ruthless hand of some "eradicator of rare plants" will visit the spot, and carry

off all he casts his unpitied and *unnatural* eye upon. The same rule applies, with some modifications, to insects. You or I, A or B, being persons of known respectability, and having won the keeper's heart by taking an interest in his young pheasants, and perchance affording him a practical hint or two on their management, are allowed to roam about and wander at will in Lord C's or Sir Harry D's woods, which are an easy walk from your house. After a due course of colds, caught by leaving your windows open at night, and of treacle and rum (not for the colds!) a "carefully compiled local list" appears in the 'Zoologist.' I may here remark, that India-rubber shoes and a dark lanthorn carry supernatural terror to the guilty consciences of night-prowlers, who, I'll venture to say, don't forget the first fright so as soon to invite a second. The story of course runs that ghosts of murdered people are to be met with o' nights in the woods, and the startling cry of the puckeridge is soon translated into the scream of a punished spirit. You thus prove no mean ally to the keepers.

Well, after acting "Jack-o'-Lanthorn" for some time, the list appears. If it be sufficiently tempting, the next spring sees the arrival of some "Mr. E" or "Mr. F," professionally retained to collect insects for the "silver-net" naturalists, and may be with a private order in his pocket from some oologist in Leadenhall Market. The historical result in the experience of the keepers is, "that there were more barren hen pheasants that year as the man went about with a green net than any other year they remember." I do not wish here to condemn the entire practice of collecting by proxy; but, as we occasionally read complaints of such and such woods and parks being forbidden to collectors, through the so-called "illiberality of landed proprietors," I wish to show that such proceedings are often not so harsh and ill-natured as they might at first sight appear to be; and I would say to such cavillers, "*audi alteram partem*."

A friend of mine, who was at Spa last summer, tells me he chanced to ask a *lacquais-de-place* whether there was any game in the country. The man triumphantly (as if his strong point had been unwittingly touched upon) pointed to a neighbouring hill, and said that on that very hill, that very season, a gray hen had hatched out a brood. The gentleman sighed on thinking of the different view taken of the rights of property in his own degenerate neighbourhood, and wondered how long a pheasant's nest in Hants would remain intact after becoming the talk of the parish. Here, apparently, the whole population rejoiced with their neighbour, and took a pride in his good fortune. The guide, gathering his thoughts from his *disjecta verba*, added "But M'sieu

may console himself, two chasseurs were placed to guard the nest day and night." "Sic vos non vobis, nidificatis aves." Birds in that country, even when nesting, are not left to themselves! Well, people in England, not liking the trouble of chartering a couple of policemen to guard any rare object from reckless depredation, adopt the alternative afforded them by the proverb, that "Silence is the best noise."

Now, all this is contrary to the spirit in which the study of Natural History should be followed. For what is the end and object of studying the works of Creation? Is it not to try and arrive at the knowledge of God? Our aim, then, should be, not so much to outdo our predecessors in systems and nomenclatures, as to show that these studies affect our hearts and lives: and that man will do infinitely more good to his generation, aye, and (if that be his wish) have much more claim to have his name handed down to posterity, by competing with the Isaac Waltons, the Gilbert Whites and the William Kirbys, in their Christian simplicity and kindliness of disposition, than if he were to succeed in overthrowing all the systems of Linneus, Jussieu and Cuvier.

But how is this to be done? We know that for 4000 years, "in the wisdom of God, the world by wisdom knew not God;" and yet we profess that our object is the knowledge of God: and let us not think that that world which was so unsuccessful owed its disappointment to its consisting of uncivilized barbarians, for it boasted the most cultivated and highly polished nations that have ever been known on earth—nations that have left us works of genius and of intellect as yet unrivalled in the world, and that have beaten us hollow in almost everything but the science of money-getting: and yet these men, with all their own wisdom and gifts of intellect, and with all the works of God's wisdom around them, "knew not God." Let us, then, "not be high-minded but fear."

But, again I ask, how is it to be done? I supply the answer in the words of a revered friend of mine, who, meeting me one day as I sallied forth armed *cap-à-pie* for an entomological ramble, concluded a conversation thus: "Yes, my young friend, I like to see it; for there are two books which we cannot read too much, the Word of God and the Works of God. But remember! the book you are going to read to-day will do you no good, unless you blend its teachings with those of the other; for though that one can do without this, this one *cannot* do without that." And as it was of old so it is now, it is not by wisdom, it is not by the knowledge of the external objects of nature that men come to know God, but through Jesus Christ: that

is, in other words, it is not by reasoning but by revelation, not by philosophy but by faith.

I add to this paper a list of the butterflies and moths (to the end of the Sphingidæ) which I have captured or observed during the last few years in this neighbourhood. The country I have worked has been geologically favourable, consisting of chalk, upper green sand, lower green sand and London clay. Botanically, it is perfect; the chalk offers magnificent beech woods and hangers, and downs studded with yews, junipers and furze: the clay boasts of its oak woods, which extend, almost without break, from Chichester to Southampton; and the few old primæval trees still remaining tell us that the ancient British Forest of Anderida stood hereabouts, now partly represented by the Forest of Bere: the undergrowth consists of birch, holly, blackthorn, whitethorn, buckthorn, &c.: the sand can still pride itself in an unreclaimed heath, and, where enclosed, is entomologically improved by plantations of larch and Scotch fir. If the list is still far from perfect, and does not yet boast of *C. sponsa*, *C. promissa* and *T. subsequa*, I plead in return that Entomology is not my profession, and what I have done and hope to do is achieved by half-hours now and then; but, if I may be allowed to contort the passage, I endeavour to have "*nulla dies sine Linnæo*."

List.—Butterflies.

Pieris cratægi. In and near woods, June. Not common.

„ *Brassicæ*, *Rapæ*, *Napi*, *A. Cardamines*. Common.

Leucophasia Sinapis. Not common; May and August.

Gonepteryx Rhamni. Common; double-brooded.

Colias Edusa. Common some years, along the railway from Chichester to Havant, and adjoining fields, &c.

„ „ *var. Helice*. I have taken three specimens of this variety.

„ *Hyale*. Five specimens, one in the Isle of Wight, the rest at the same place as *C. Edusa*.

Thecla Betulæ. In Woolmer Forest and Forest of Bere; September.

„ *Quercus*. Ashford, near Petersfield and Forest of Bere.

„ *Rubi*. Same as above.

Chrysophanus Phlæas. Common.

Polyommatus Argiolus. In the garden at Ashford, occasionally.

Polyommatus Albus. I think I have taken it at Ashford, but am not quite certain.

„ *Ægon*. Local, but common.

„ *Alexis*. Common.

„ *Adonis*. I have not taken this nearer than the Isle of Wight.

„ *Corydon*. Same as above.

„ *Agestis*. Rare.

Nemeobius Lucina. Widely dispersed and abundant in woods.

Limenitis Sibylla. Ashford, Forest of Bere and Stansted Forest. In 1853 I took fifteen in a very few minutes in the Forest of Bere.

Argynnis Paphia, *A. Aglaia*, *A. Adippe*. In woods.

„ *Lathonia*. I have had the great good fortune to capture six specimens of this splendid insect: with two exceptions I think I have taken all that I have seen. These exceptions were, one last year in the Forest of Bere, which I observed sunning itself within a yard of me, but over-anxiety and an intervening spray of blackthorn defeated the first dash with my net, and, after a frantic chase of some minutes, a hostile bramble reduced me to something below a level in a deep ditch: the other specimen I saw the year before near the same place, but I had no net with me, and failed to catch it with my hat. The specimens I took were on the skirts of, or just inside, woods. All occurred in the latter part of June.

„ *Euphrosyne* and *Selene*. Very common in woods.

Melitæa Artemis. Marshy ground near Ashford.

„ *Athalia*. One specimen at Ashford.

Vanessa Cardui. Sometimes very common.

„ *Atalanta*, *Io*, *Urticæ*. Common.

„ *Polychloros*. Widely distributed in woods, and not uncommon.

„ *C-album*. Nursted Woods and Forest of Bere; not uncommon.

Apatura Iris. Not uncommon in woods at Ashford and Forest of Bere, but of course very difficult to capture. I took a magnificent female on the 26th of August, and the same year took another on the 14th of July.

Arge Galathea. Common.

Satyrus Semele. Common on the sea coast, eight miles from here, and in the Isle of Wight.

„ *Janira*, *Tithonus*, *Megæra*, *Ægeria*, *Hyperanthus* and *Pamphilus*. All common.

Pamphilia Linea and *Sylvanus*. Common.

„ *Comma*. I have taken a few specimens at Ashford.
Syrichthus Alveolus. Common in woods.

Thanaos Tages. Common in woods.

Sphinges.

Trochilium tipuliformis. Ashford, on vines; June.

„ *formicæformis*. Forest of Bere. Two specimens.
Ægeria apiformis. Willow-bed at Ashford.

„ *bembiciformis*. Same as before.

Sesia bombyliformis. Forest of Bere, and at *Rhododendron* flowers in the neighbouring gardens; June.

Macroglossa Stellatarum.

Chærocampa Elpenor.

Deilephila Euphorbiæ. On the sea coast, about eight miles from here, where *Euphorbia paralias* abounds, I have observed unmistakable tracks of the larvæ of the insect, but have not yet got it.

„ *Galii*. A brood of the larvæ were found in the flower-garden at Uppark, by Mr. Weaver, secretary there.

Sphinx Convolvuli. Abundant in 1846, when I took it just after dusk, hovering over a bed of *Verbena*, and also at the tall pink *Phlox*. I have met with it a few times since, both at Ashford and near here.

„ *Ligustri*. Common.

Acherontia Atropos. In potato-beds at Ashford. *Atropa belladonna* abounds in the woods, but I have never found the larvæ of this moth on it yet, though I have searched.

Smærinthus Tiliæ. Not uncommon; Ashford, &c.

„ *ocellatus*. Same as above.

„ *Populi*. Same as above.

Anthrocera Trifolii. Three specimens; Ashford.

„ *Filipendulæ*. Common.

Procris Statices. Forest of Bere.

I reserve the rest of my list for a future number.

WILLIAM HENRY HAWKER.

Horndean, Hants,
February 10, 1855.

Note on the Economy of Saturnia Pyri.—I obtained nineteen cocoons of this species, collected in the neighbourhood of Paris, in the autumn of 1829. Of sixteen cocoons remaining alive in 1830 (having given two away, and pierced a third, with a view of preserving the pupa), the first imago was hatched about the 27th of March, the cocoons having been kept all the winter in an extremely warm room, which undue degree of heat does not appear at all prejudicial to this insect; two more made their appearance between the above period and the 6th of April, all three females; leaving, as far as I can judge, but two males in the whole collection, which are not yet (April 7th) disclosed. The three now existing were perfectly developed, notwithstanding, in the first instance, the cocoons were not bound down, a precaution I adopted immediately for greater security. The females are much more active than I imagined; fluttering about during the night in their prison, to the great detriment of their wings: their flight is very easy and rapid, and they are readily attracted to a lighted candle. I have just opened the body of a dead female, but, to my surprise, could find neither eggs nor even any apparent ovaries. That this insect, in its larva state, is little sensible to cold, may be inferred from the fact, that I could obtain at the close of the most ungenial summer of 1829 no less than nineteen cocoons, and had the season been more propitious I might, probably, have procured many more.—*W. A. Bromfield.* This note by the late amiable Dr. Bromfield was obligingly forwarded me for publication by Mr. Curtis.

Are the Psychidæ to be considered Bombyces or Tineina?—This small group, small at least so far as concerns our Fauna, is at present knocking at everybody's door for a protector. Like the genus *Eudorea* it is bandied about, now here, now there, one refusing to place it amongst the Bombyces, another amongst the Tineina. Much weeding and transplanting has been done of late, and many of the little fellows must feel rather queer with such strange signboards put over them. It seems strange that amongst the many who have such ample means of determining and fixing the "locus" of the Psychidæ—I refer to the records of the researches of others which they possess, as well as to their own investigations—that there should still be so much division on the subject. One party asserts and insists that they are true Bombyces, and so he arranges them in his cabinet. Another prints a list in which they do not figure in that section. A third party, whether acting on this hint or being emboldened at seeing his own views shining through the cloud, pauses until it clears a little, and produces a most able Monograph, showing them to be a section of the true Tineina: many are the comparisons which he calls to his aid. Long before the appearance of Mr. Doubleday's list,—indeed until then I was not aware that any one entertained similar views to myself,—and consequently long before the publication of M. Bruand's Monograph, I often thought of their great external resemblance to some of the Tineina, from the many points which they held in common with that family, from their very earliest stages up to their final development. First, we have the larva bearing its house about with it on its back as in *Talæporia*, *Solenobia*, *Diplodoma*, *Xysmatodoma*, &c. Then we have apterous females, as in the two former of these genera. To this circumstance I do not attach so much importance, as I see no reason, because we have not hitherto met with them, why, in the yet unexplored regions of the earth, the *Rhopalocera*, *Sphingina*, *Noctuina*, *Pyalidina*, &c., should not be found having apterous females. It would only be completing the gradation, and is not drawing too largely upon the imagination to suppose this. In the males again, the contour of the

wings partake very much of those of *Talæporia* and the others mentioned before, and the covering of the wings also, in some of the species, being hairy rather than scaly, bind them to a portion of *Lampronia* and other genera. On denuding the wings and examining their neuration, we find that the affinities do not cease entirely, although we feel bound to say that we agree with M. Bruand when he states that this is a character on which not much dependence can be placed, seeing that in the same genus one species partakes of a character wanting in another. We give his own words: "Voir les nervures de fascelina et pudibunda: l'interne, qui est double chez la première, est simple chez la seconde." (Mon. Psychides, p. 125.) These we think are the most prominent points, those on which all from a little careful observation may be able to give an opinion. But we will proceed a little further, as, although the characters are not so conspicuous, yet they are equally important, consisting of the minutæ into which many may never have enquired, and many others may not have possessed the means of examining; whilst a third class may not have thought of comparing them. These bear with them some little testimony of the views entertained by ourselves. Certain of the species of the Psychides are without a tongue, and on referring to the *Tineina*, *Exapate*, *Dasytoma*, *Talæporia*, *Tinagma*, &c., are found minus that organ, while in several other genera it is so short as to be scarcely discernable: the palpi also are sometimes entirely wanting, as in the case of *Cemiosoma*, &c., while in other genera, such as *Diplodoma*, *Xysmatodoma*, *Ochsenheimeria*, at least one pair is undeveloped. From the foregoing remarks it will be seen that we consider the Psychidæ nearly related to the *Tineina*, and that they especially resemble *Talæporia*, *Solenobia*, *Diplodoma* and *Xysmatodoma*, in external characters. The two former of these genera have apterous females; the two latter winged in both sexes. The tongue is wanting, and the maxillary palpi are in all four cases undeveloped. The larvæ are also case-bearers. And now if we shall have thus been the means of inducing others to come forward with such proofs as they have collected, either as relates to the consignment of the Psychidæ to the *Bombycina*, or to the *Tineina*, we have obtained the end which we had in view.

—John Scott; *South Bank*, December, 1854.

Occurrence of Spælotis valesiaca, S. cataleuca and Botys terrealis, near Beddgelert.—Any entomologist whose rambles may lead him into North Wales, would probably find a rich field for his labours in the neighbourhood of Beddgelert. My own experience of the locality is but limited; however, the result of a few hours' collecting about the 23rd of July last, was twenty-eight of *S. cataleuca*, one *S. valesiaca*, and a *B. terrealis*. *S. cataleuca* was flying in the middle of the day with the greatest activity, and in swarms, over a quantity of *débris* from some old copper mines, their lively habits, together with the roughness of the ground, rendered their capture somewhat difficult. Out of this same *débris* I also started a fine *S. valesiaca*, which was readily captured; another specimen I had chanced to detect at rest near Capel Curig a few days before. *B. terrealis* I took amongst some brake at the foot of Snowdon, very near Beddgelert, and perhaps at an elevation of 300 feet. The old mines lie to the left of the road from Beddgelert towards Llanberris, about two miles from the former place, and may readily be recognised from having a powder magazine and manager's house attached, both partially in ruins.—Henry Evans; *Darley Abbey*, Derby, Feb. 19, 1855.

Habit of the Larva of Glyphipteryx Haworthana.—Mr. Edleston informs me, he has been acquainted with this larva for years; it feeds in the heads of the cotton-grass (*Eriophorum*). Mr. Edleston writes, "suppose a collector wished to get them now, I

should say, go to the 'Moss' and pick up all the old cotton-grass heads off the ground, and by so doing, Mr. Haworthana would appear in due course."—*H. T. Stainton; Mountsfield, Lewisham, March 3, 1855.*

Occurrence of a Water Beetle new to the British Fauna.—It gives me great pleasure to record the capture of a *Hydroporus* new to our native lists, — five examples of the *H. elongatulus*, *Sturm* (recently determined for me by Dr. Schaum, of Berlin), having been discovered by myself on Midgeley Moor, near Halifax, during July, 1852. They were taken in company with *H. Gyllenhalii* and *H. tristis* in a small pond, or tarn, above Hebden Bridge; and, had I recognised them at the time as anything uncommon, I might, doubtless, have secured considerable quantities of them. They are darker than the ordinary continental specimens, appearing to want the diluted or piceous tinge towards the base and margins of the elytra, which is so evident in their German representatives. — *T. Vernon Wollaston; 25, Thurloe Square, Brompton, March 6, 1855.*

Note on the Orchesia minor of British Cabinets.—The *Orchesia minor* appearing, from its great rarity, to be but imperfectly known, not merely in this country, but throughout Europe generally, a few words concerning it may not be altogether unacceptable. It appears to have been originally described by Mr. Walker (*Ent. Mag.* iv. 83), in 1837, from a Scotch specimen found near Lanark; and subsequently (as Dr. Schaum, of Berlin, informs me) by Rosenhauer, from the Tyrol, under the title of *O. sepicola*. It seems essentially an autumnal species; coming into being about the middle of July, and lasting until September; at which time, in certain localities, I have observed it in tolerable numbers. It is particularly attached to the common sloe (*Prunus spinosa*, L.), from off the branches of which it may be occasionally beaten, especially in low, damp thickets (beneath trees), on a clayey soil. Under such circumstances I have captured it at Spridlington, near Lincoln, from July to September, not unfrequently; as also at Shenton, Leicestershire (in Ambion Wood), towards the end of October, in company with *Phloiophilus Edwardsii*, and other insects of post-autumnal habits. The shuffling or skipping motion, so characteristic of the genus, is carried out to such a singular extent in *O. minor* that, even whilst in the net, it is by no means easy to secure.—*Id.*

Note on the Tachyporus nitidicollis of Stephens.—It may be a fact worth recording, for the collectors of our native Brachelytra, that the *Tachyporus nitidicollis* of Stephens is a species unknown on the Continent, and one which has consequently escaped notice in Erichson's Monograph of the Staphylinidæ. For many years past I have been accustomed to capture it in several districts of Ireland, and I had always regarded it as peculiar to that country; nevertheless, Mr. Stephens' dictum of "hedges, near London" (although it is true that a single specimen only exists in his cabinet) would seem to imply that it has an English "habitat" likewise. At any rate it must be extremely rare on this side of the channel, since it has never come beneath my own observation, nor am I aware of its occurrence in any collection except the Stephensian one. In Ireland, however, it is apparently universal; and in the counties of Cork and Kerry it may be taken almost everywhere. In the vicinity of Killarney it abounds, particularly, during the autumnal months, around cultivated grounds, and in grassy spots beneath trees. In the neighbourhood of Kanturk it occasionally teems; and in the plantations of my friend, W. Leader, Esq., of Rosnalee, it is literally a nuisance. I have also met with it near Dublin; and towards the end of September, 1854, it was tolerably common in the grounds of Trinity College. I may add that I

have lately transmitted a series to Berlin, for examination by Dr. Schaum and M. Kraatz, by whom it was altogether unknown.—*Id.*

White Ant in India.—I have just received the following in a letter from a near relative, in the Horse Artillery, at Bangalore:—"Some time ago, I think in 1853, an order of Government directed all the white ants' nests within fifty or a hundred yards of the public buildings to be rooted out. In doing so, numbers of queen ants were found, and, strange to relate, in *one nest* no less than three queens were discovered, and not merely in one nest, but actually and truly in *one cell!* In several nests two queens were found. These are curious facts, are they not? Let me know if this has been discovered before. In my opinion there must be two kinds of queen, as at Secunderabad I made a coloured sketch of one from nature, and made another officer compare the sketch with the insect: well, on coming down here to Bangalore, and showing the sketch to a naturalist, he said I had evidently made a mistake in copying it, as he had never seen a queen like it, and assured me they were not of the same kind at this place, as he had seen numbers of queens when they were dug up by reason of the same Government order. I will, however, (D. V.) manage to get one and compare it with my sketch, which I know is correct. I watched the one from which my sketch was taken for hours, and highly amused was I in so doing. I had unfortunately at that time no large magnifying-glass, but could see with the naked eye that there were four or five different kinds of small ants performing their relative duties around their queen; one kind apparently cleaning her; a second polishing the shields on her back; a third evidently carrying away the dirt or dust swept off her; a fourth kind, with very strong mandibles, superintending and *certainly* correcting the lazy ones; still, a fifth kind carrying away the eggs. All the time I could plainly distinguish a drumming noise proceeding from the bunch of them, accompanied by the champing of the mandibles I spoke of (even of a night in your room where the ants are working you can hear the latter very plainly); I watched and watched, until the queen (literally a great piece of moving fat) actually made me sick. She is, without exception, the nastiest looking creature I ever beheld. As soon as I have obtained a Bangalore queen (if there is any difference between the two) I will send you the coloured sketches. I have never yet seen a proper sketch of a queen white ant; the woodcuts seen in books are absurd, and no more like the original than the moon is like cream-cheese. I know (as I told you before) my sketch is right, as several of us compared it closely with the original."—*J. M. Jones; 3, Garden Court, Temple, March 6, 1855.*

Memorandum on the Habits of the Jack Snipe.

By the Rev. J. C. ATKINSON, M.A.

The jack snipe, says Mr. Yarrell (vol. ii. p. 612) "when not searching for food chooses sheltered situations among strong rushes or coarse long grass, and the luxuriant vegetation common to moist grounds. In such places it is remarkable for its sluggishness, seldom taking wing till almost trodden upon, which has induced French naturalists to call this species Bécassine Sourde, as though it were deaf to the

approach of an enemy, and instances have occurred in which a jack snipe has allowed itself to be picked up by hand before the nose of a pointer." . . . "It does not, when flushed, utter any note."

In the month of March, last year, I fell in with five or six jack snipes in a piece of boggy ground on the moors here, and on one of these I very nearly trod as I stepped across a sort of water channel. This bird, on being so very rudely flushed, did utter a note,—the one solitary instance in which I have ever heard the note of the jack snipe: it was a little, faint, stridulous *pipe*, and more resembling the cry of the common bat than that of any bird I ever listened to.

In reference to the other peculiarity in the habits of the jack snipe described in the above quotation, I may mention, that as I was walking a few weeks since with my gun, I wounded and followed a partridge. While searching for it I walked up a hedge, by the side of which a little stream of a few inches in width trickled along. An object in this stream caught my eye sufficiently to arrest my attention; a second look showed me it was a jack snipe lying perfectly motionless on its breast, and with head stretched out, on the surface of the water, which was streaked and spotted with a few blades and leaves of water-grass and other aquatic plants. That it was not dead was apparent from the fresh unruffled appearance of the plumage; that it was simulating death was equally apparent. I stood within two paces of it, watching it for a minute or two; it remained unmoved; I advanced a step nearer, still it did not stir; I stooped, put out my hand, and then, but not until my fingers were within a foot and a half or so of it, did the little fellow show that it was only feigning all this time, for quickly and briskly enough it rose and flew away.

Now, I do not hold that this jack snipe showed itself either "sluggish" or "sourde" by the conduct I have detailed; on the contrary I think, that in virtue of that instinct which, in such a vast number of the animals we know most familiarly, looks so marvellously like something higher than what we commonly understand by instinct, it did what was best and most appropriate under the circumstances and in connexion with the object in view. Every wild creature, with an exception or two, when disturbed by man, or indeed any other of its enemies, seeks refuge in one of two ways—by flight or by concealment; and as far as my own observation goes, I believe that the latter way is the one which the creature by its first natural impulse is led to attempt, and is in fact the one much the most frequently attempted when at all practicable, except under abnormal conditions. Why does the hare on the stubble or fallow, as you go by her within a few

yards, only crouch down the closer in its seat? Why does the waterhen, as you walk along the stream, make for the overhanging bush, often on foot,—if by flight, only by a short one,—and there emerge itself? Why does the partridge, after lifting its head for a moment to survey the approaching intruder, cower close to the ground, if at all rough of surface, or crouchingly run to the nearest available covert of stubble or weed or bush? Why does the common snipe, as you draw near to its haunt, leave the ground it was feeding on, and hastily run off to the sheltering rushes.* I say, because instinct teaches them to employ those habits which Nature has given them for such purpose in seeking safety by means of concealment, and because, moreover—shall we again say?—*instinct* points out to them the way of concealment under the circumstances of place and possible shelter, the most easily attained and likely to be effectual. Alter the circumstances, and you alter too the conduct of all these creatures. The little-disturbed covey of partridges that yesterday hid themselves till you were within twenty or twenty-five yards of them, to day, when snow covers the ground, flies hastily off as soon as you come in sight. The hare leaves the open field and goes to the hedge, and, unless that hedge be very thick, very likely steals away on the other side long before you come abreast of it. The snipe, if not already driven from its haunt of yesterday, rises wild, and betakes itself to some open spring, or else some close concealment. But why? Because their “instinct” teaches them that concealment is, under the circumstances, impossible: nor do I think the increasing wildness of the game birds as the season advances weakens the argument. It does not take long to teach birds, the dwellers in islands hitherto untrodden by man, to avoid their first human visitor as an enemy and destroyer; and depend upon it, the sound of the gun is soon recognised and understood by the grouse and the partridge; and besides, the birds that have tried their powers of flight once and again when alarmed or disturbed soon learn to place confidence in that resource.

No doubt some creatures resort to concealment much more than others. The water rail and land rail both must be surprised to be made

* All these facts I have verified by personal observation within a few weeks past. Twenty times have I seen, since the snow first set in, the waterhen retreating to concealment as I approached, or the tracks of its having done so within a few minutes past. Twice I have observed the snipe acting as mentioned in the text; while, with respect to the partridge and hare, every person the least conversant with their habits will at once recognise the truthfulness of the reference I have made to a part of those habits.

to fly at all, and rarely, if ever, can be flushed a second time. The jack snipe and woodcock (and often the common snipe) "lie" remarkably "close." The coot and the waterhen can scarcely ever be driven from the sedges and reeds, and so on; but still, allowing for variation in habits, I think observation shows that wild creatures generally, when they are able, through a combination of natural powers and favourable circumstances, try in the first instance to avoid what may be approaching danger by avoiding discovery; if this attempt appears likely to be in vain, then by flight.

Now I think that the jack snipe I have mentioned was influenced to act as it did by this instinct. There were no "strong rushes," or "coarse long grass," or "luxuriant vegetation," anywhere near it: concealment by such means was out of the question; but *quasi*-concealment by means of utter stillness and simulated death—a means resorted to, observe, by many another creature besides the jack snipe, and not imputed to them as sluggishness, or stupidity, or intellectual deafness—is practicable, and therefore adopted; and, indeed, the little bird might well have gone unnoticed by nine passers-by out of ten, although of much quicker sight than myself.

I know that man is "fearfully and wonderfully made," and I believe that the inferior orders of animate creation are, at the least, "wonderfully" made, and it is with feelings of distaste that I hear whole species of them vilipended as to their—what in our own case we should call—common sense. It seems to me like throwing a slur on Creating Wisdom. I believe that the foolish guillemot and the dotterel are as sufficiently furnished with the common sense requisite in their own scale of creation as the race of mankind is in theirs, while I am sure that the "silly goose," the "obstinate pig," and the "stubborn" and "stupid jackass," very frequently are better stocked with the article in question than many of those who apply these epithets to them; nay, even the booby and the noddy might not be found so very "deficient" after all, if only we knew them, *and they knew man*, more intimately. For my own part, I have the most entire conviction that the more closely we observe the ways and habits of animal creation, the more thoroughly and intimately we become acquainted with the laws of their being, the more searchingly we trace and investigate the characters legibly—and to the true inquirer not unintelligibly—impressed upon them by the Author of their existence, the more, even among the most contemned and despised races, shall we find to admire, to wonder at, and reverently

to pronounce compatible only with the possession by their Maker of nothing short of Infinite Wisdom, Infinite Power, and Infinite Goodness.

J. C. ATKINSON.

Danby, Grosmont, York.

Occurrence of Wild Fowl at Scarborough.—We have had abundance of wild fowl on our coast this severe weather. I here send you a list of birds brought in from February 1st to the present time, to be preserved:—Brent geese, three; smews, four; common scoters, three; velvet scoters, three; goldeneyes, fifteen; scaup ducks, sixteen; mergansers, two; rednecked grebes, five; eared grebe, one; blackthroated diver, one: all in fine adult plumage.—*Alfred Roberts; King Street, Scarborough, February 27, 1855.*

Winter Visitors to the Norfolk Coast during the late severe weather.—The unusual severity of the weather during the last two months naturally put collectors on the *qui vive* for good birds; but although our coast is generally noted for the occurrence of rarities, the present season seems chiefly remarkable for the numbers of scarce species, usually appearing in small quantities. Most of the common kinds of wild fowl and hoopers have visited us in very large flocks; the goldeneye and scaup ducks peculiarly numerous: at the same time there has been an almost total absence of some species looked for in sharp weather, such as the pintail and long-tailed ducks; and, in another class, the Bohemian waxwing has not, I believe, occurred in the county. The following is a list of such birds as have come under my notice:—

Snow buntings and bramblings. Large flocks of these birds have been met with. A bird-stuffer in this city has now eight of the former alive and doing well in confinement.

Hawfinches. Several of these birds have been shot lately.

Lesser Spotted Woodpecker (females). Rare.

Rock Pipit. Killed at Yarmouth.

Hoopers. More than twenty of these swans have been killed to my knowledge.

Bewick's Swan. Two shot at Yarmouth, one at Hickling, and two at Bowthorpe, near Norwich.

Whitefronted, Bernicle, Brent and Bean Geese.

Pinkfooted Goose. One specimen from Holkham.

Sheldrakes. Five adult birds.

Velvet Scoters. One old male and two females

Common Scoters. Extremely numerous.

Goosanders. Out of thirteen specimens, six adult males; very fine.

Red-breasted Merganser. Three old males, in full winter plumage.

Common Cormorants. Two.

Green Shag. One.

Blackthroated Diver. Young male.

Redthroated Diver. Six or seven, all immature. — *H. Stevenson; Norwich, March 19, 1855.*

Occurrence of the Polish Swan at Hornsey Mere.—On the 2nd of March two fine adult specimens of the Polish swan were killed on Hornsey Mere (near Yarmouth), by Mr. Rising's keeper: they were quite alone, and difficult to approach. One of the specimens was sent to Mr. Yarrell for his inspection, who confirmed me in my opinion, as to its being the "*Cygnus immutabilis*" (changeless swan) of his work. Several flocks of this wild swan were seen in the neighbourhood during the late severe weather, and within the last ten days three more birds have been obtained in the same locality as the above; one of which proved to be Bewick's, and the other two hoopers.—*George S. Frederick*; 13, Westbourne Terrace, North, March 19, 1855.

Black Swans Breeding in Confinement.—A pair of black swans which have been in my possession for about three years, without having bred, have just hatched three cygnets, from four eggs. They were very busy quite early in January in making their nest, which consisted of rushes, which they collected themselves on the banks of the canal; and of which they collected a large quantity, and which they were continually adding to the nest during the time they were sitting. They have chosen a spot entirely exposed to the north wind without the slightest shelter, and at times I feared they would have been buried in the snow. The first egg was laid about the 15th of January, and the young ones were hatched on the 8th of March: they are quite strong, and there seems every chance of their living.—*Samuel Gurney, Jun.*; Carshalton, March, 1855.

Curious act of Autosurgery in a Teal.—On the 27th of February my brother wrote to me from Conway, North Wales, and he says, "I shot a teal some days ago which had had its leg broken some days previously, probably by a shot. This bird had most ingeniously spliced and mended it. Through a hole in the skin the bird had passed tolerably large feathers, had passed them round the protruding bone and back again through the hole, thereby keeping the bone not only covered, but pretty close to the fracture; several feathers were thus employed, and all fastened off and glued together by means of the clotted blood, so that a casual observer would not have remarked it. I thought it uncommonly ingenious, and, in my desire to ascertain the *modus operandi*, I pulled all the feathers out, or I should otherwise have preserved it." I wrote to my brother to know whether he was certain it was not done by some other means, as for instance, by the shot. To my inquiries he replies: "The teal's leg was broken in the length where there are no feathers, and the principal feather inserted by the bird was not such a feather as grows on the upper portion of the leg, but appeared to me to be a long breast-feather or wing-feather near the breast. The manner in which it was inserted, leaves no doubt in my mind that it was so placed by the bird, as were the other feathers which I have described."—*T. A. Preston*; Emmanuel College, Cambridge, March 13, 1855.

Electric Property in the Feathers of a Woodpigeon.—"On Thursday, the day before the thaw commenced, I shot a woodpigeon, which I put into my pocket; on taking it out when I got home, a good many feathers which were loose, were so attracted to my body and clothes that it was a work of labour to remove them all; and when I held one of the feathers in my hand and put my finger or anybody else's finger near the feather, it was attracted to it. Now, I am aware that this is caused by the electricity of my body, but as no other feather was thus attracted except taken from the body of the lately-killed pigeon, I should like an explanation of this." In answer to questions put by me, my brother says: "The pigeon had been shot fully an hour before I got home. It was very severe frost, probably the feathers had retained

a good deal of their natural heat, from being carried in my pocket: I fancy the state of the atmosphere had a good deal to do with it. The feathers of the bird next day showed no signs of electricity." Are feathers in general so electrified? or does this happen in certain states of the weather? If you would kindly furnish me with any information on these points, you would much oblige.—*Id.*

Some Observations on the Salmo Estuarius or Estuary Trout.

By R. KNOX, M.D., F.R.S.E., &c.

MANY esteemed naturalists still view certain members of the natural family of the Salmonidæ as mere varieties, dependent for their origin and permanency on the influence of the surrounding media in which they have been accidentally placed. In respect of some of these so-called varieties such a view is probably the correct one; but having for many years adopted other views as to the origin of species, the relations of species to natural subfamilies, and of these again to natural families or genera, and having lately tested these views by an appeal to the principles of transcendental anatomy, I continue to view as distinct species many races or kinds of animals which others look on as mere varieties.

Amongst these I place a race or kind of trout which I have ventured to call the estuary trout (*Salmo Estuarius*), simply because I have hitherto found it to frequent chiefly those waters "into which the tide ebbs and flows," waters very difficult to define, a fact which many proprietors of salmon rivers have learned to their cost. The term "estuary" will not, I hope, be objected to on the ground that there are many rivers which have no estuary, and in which this species of trout may notwithstanding be found, my meaning being merely this—that the trout in question inhabits those waters, and those waters only, influenced by the tide; the brackish waters, in fact, of rivers whose limits neither naturalists nor engineers, lawyers nor chemists have been able rigorously to define.

The trout I am now to describe is a fine and delicate fish, with all the beauty of the class or natural family to which it belongs. It inhabits the brackish waters or estuary, and I have never found it higher up in the rivers towards their sources, and only twice in the sea. Those I have examined, and they have been very numerous, were mostly taken with the net near the mouth of the Tyne of East Lothian, in North Britain, and in the Nith of Dumfriesshire (also in Scotland),

between the bridge and the Solway Frith, into which the Nith pours its waters. They have been taken also in the estuary of the Forth, and, as I have been assured, in the brackish waters of the Esk, in Eskdale, Yorkshire. They were generally about a foot in length, although I have seen taken, and examined one which weighed four pounds, a weight which no doubt the greater number would reach but for the constant net-fishing which prevails in these waters. That the young of these trout were also in the net at the time the larger were captured is extremely probable, as some of the nets took everything down to the minnow and herring fry; but the young of all the Salmonidæ bearing a close resemblance to each other did not then receive from me all the attention the subject merits. Agreeing so far with my distinguished friend M. Valenciennes, that naturalists have to do only with the adult individual of any species, yet, as an anatomist interested in the advance of Philosophic Zoology, I feel bound now to say that neither the anatomy nor natural history of the grown individual will ever enable the naturalist (whatever may be his genius or learning) to place Zoology on that basis which alone entitles it to the name of a Science.

As regards its food it seems to me, after numerous examinations, to live almost exclusively, during the summer at least, on a small shrimp (*Gammarus*), which floats in innumerable shoals in these waters: these shoals or groups assume the form of a cone, the apex being upwards towards the stream, and generally close to some bank or abutment projecting into the main stream of the river. With these small shrimps I have always found the stomachs of the estuary trout gorged, and conclude that it must be the food they prefer: a draught of the net, in the Nith, took several other species of the Salmonidæ, and thus a comparison could be and was instituted on the spot: in the true salmon no food was found but the remains of the eggs of the Echinodermata; in the sea trout or *Salmo fario* this food was also found, but occasionally the sand eel and small herring; the same remark applies to the hirling: the small common river trout and the par, which were also taken in the net at the same time, had been feeding abundantly on flies, screws, cad bait, and all the ordinary food of the common river trout which anglers know so well; the estuary trout alone had been preying on the shrimps or Gammari, and nothing else.

As food for man these trout are excellent; their flesh is of a pink colour, and quite equal to the fine river trout of England. I fancied them equal in this respect to the celebrated Loch Leven trout, but this is a matter of taste, which I mean not to insist on.

And now, in respect of their distinguishing or specific characters, external and internal: they are a red-spotted trout, both above and below the lateral line; their head and fins are proportionally more delicate than those of the common red-spotted trout of the Scottish rivers and brooks; their proportions are, in fact, somewhat intermediate between the delicate lacustrine trout (*Salmo Levensis*) and the common riverine species, neither do I believe them transmutable or convertible into any other species of trout by any natural changes now in operation. What forms they might assume if compelled to live wholly in the sea, or in waters (whether lacustrine or riverine) wholly fresh, is a question I shall not discuss here; my own opinion is that they would become extinct.

The place it is entitled to in the scale of the natural family of the Salmonidæ I shall consider presently. The teeth are nearly as large again as in the common river trout, and the dentition is as follows:—

Upper jaw.—Supermaxillary		25 + 25 =	50
Intermaxillary		10 + 10 =	20
Palatine		14 + 14 =	28
Vomerine as usual in a double alternating row			20
Lower jaw or mandible		20 + 20 =	40
Lingual		6 + 6 =	12

These teeth are reckoned, not from the actual number of teeth present, which varies of course at almost every instant in the life of the fish, but from the number of distinct mucous cavities fitted for the reception of the teeth, whose number determines rigorously that of the teeth which are present or which are in process of development, and which disappear when, by age or maturity, a bone is about to become edentulous.

The vomerine teeth, the peculiar characteristic of the Salmonidæ, and to the arrangement and development of which M. Valenciennes attaches so much importance, do not differ in any remarkable way from others of the trout species. The anterior transverse vomerine teeth are not more distinct than they are in the common and Leven trout; that is, they do not extend beyond the mesial line, as in the common or true salmon. Having neglected to note with sufficient care the dentition of the large or full-grown estuary trout, those of 4 lbs. for example, I am unable to say what changes take place in the vomerine teeth. The law of *edentulation* (loss of teeth), as regards

the vomerine teeth in the Salmonidæ, I have ascertained to be thus : when young, all the species of the three subfamilies, into which the Salmonidæ may, for the convenience of description, be subdivided, have the same dentition, which, as regards the vomerine teeth, consists in a double alternating row of teeth, with a few transverse teeth in front upon the fore part of the vomer.* As the fish grows the great generic character and law yields to the law of specialization and of family. Thus, as regards the Salmonidæ, if the young fish is to grow into a true salmon, it loses the vomerine teeth from behind forwards, the transverse teeth in front being those which remain to the last. This, in fact, is the special character of the dentition of the true salmon. and the law which regulates it. If, on the other hand, the young fish is to become a sea trout or Fario (a subfamily strongly allied to the true salmon by some species, and as strongly no doubt with true trout on the other), it also loses the vomerine teeth from behind forwards, but retains a few occasionally in a single row, the transverse or front vomerine remaining as in the salmon ; but if the young fish is to grow up a trout, then the transverse teeth, always few in number, either remain as they were or are lost, the double alternating row continues, and the bone becomes edentulous from before backwards. Which form prevails in the estuary trout I know not ; I should think the latter ; but, be this as it may, the estuary trout seems to me to fill up that link in the grand serial chain of the Salmonidæ, connecting the river trout with a fish of the salmon kind which appears in the markets occasionally in September,—a fish not yet well described nor placed ; the red or purple-spotted salmon.

In thus describing the characteristic dentition of the three subfamilies of the Salmonidæ at present known to zoologists, I do not pretend that such distinct lines of demarcation absolutely exist in nature. To us they seem real, and so far are real, because we know no better ; but, in the great scale of Nature, there are in reality no such things as species or subfamilies, all gaps being no doubt filled up, did we but know sufficiently the fossil and the recent zoologies. Generic distinctions seem alone to exist and to be recognised in Nature's scheme, and some distinguished anatomists are disposed to doubt even this. In the mean time, for the sake of classification and in the interests of science, these characters of subfamily and species answer well enough.

In August the milt in some specimens was found to be largely

* Chevron of French naturalists.

developed. The vertebræ are 60; there are 32 floating ribs on either side, and the pancreatic cœca, or rather cæcal apertures, were 36; but, if my notes do not mislead me (and they are not very distinct, having been made more than thirty years ago), I find that the number varied, a circumstance I am disposed to attribute to some error in observation.

The insect which the salmon and sea trout bring with them from the sea is also found to infest the estuary trout. The skeleton tissue is not so dense as in the common and Leven trout: it may induce zoologists and others interested in Natural History to examine the tables of proportions and measurements which I here annex, if I briefly state my own views on the relation of species to natural family or genus, based partly on these tables, but chiefly on the transcendental in anatomy.

The young of every large natural family, by the law of unity, greatly resemble each other: this extends to all the species, externally and internally. As the young grow the characteristics of subfamily and species predominate over the generic, or rather, many of the latter disappear, leaving some which by their presence mark the species and subfamily. If we apply this to the natural family of the Salmonidæ, a member of which I now describe, we shall find the view, though transcendental and abstract, fully supported by an appeal to the material manifestations of forms, and fully supporting these propositions: 1st, the specific characters of all the species of any natural family are included in the young of every species of that family; 2nd, the development of any species depends on its position in time and space, and not on the transmutation of one species into another; 3rd, were all the species of any natural family destroyed saving one, from that one all the other species belonging to the same natural family might be developed, this being merely a question of time, locality, and geological influences.

Thus no species grows out of another; all are foreseen in the natural family or genus, as proved by Embryology and by the Transcendental. The following sketch of the natural arrangement of the Salmonidæ, extremely imperfect no doubt, is subjoined merely to explain the view.

Salmonidæ.—A Natural Family.

Generic characters, as exemplified in the young of any of the species: 1st, by the dentition; 2nd, by the system of coloration—

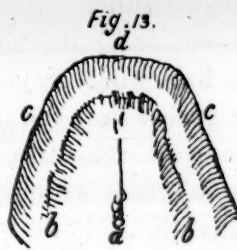
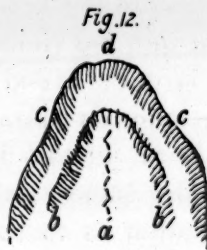
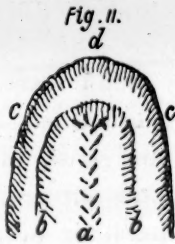
i. e. by 1, red spots; 2, dark spots; 3, par markings; 4, silvery scales.

Subfamilies.—Adult.

* 1. Trout.

2. Sea Trout.

3. Salmon.



Colouring.

Red spots or dark spots, as the case may be. The red-spotted prevail in rivers; one species frequents the estuary: the dark-spotted trout are lacustrine generally.

Many dark spots above and below the lateral line. By so much as the fish is silvery and scaly and with few spots, by so much does he approach the pure salmon, and in health he loses all the red spots.

Silvery scales; a few dark spots above the lateral line. When the dark spots below the lateral line amount to five or six, the salesman knows that the fish is coarse, and that it approaches the Fario in character. The specific character, then, of the very fine salmon is to lose all the spots of every kind.

Lastly, for I am unwilling to extend this memoir further, species no doubt exist or have existed approximating all these species and subfamilies, leaving no gap or deficient link in the serial unity of the family; and these species will be found to be characterised, not by any new feature, not by any character wanting in the young, but the predominance of one to the exclusion and extinction of the others. The embryo, the young, is perfect generically; the adult specifically. This is the law of species, and this is no doubt the law by which Nature provides for the extinction of certain species and the appearance of others in time and space. Were our observations

* Fig. 11. *a*, marks the vomerine teeth in the trout and in the *young of all* the species of the Salmonidæ. Fig. 12. *a*, vomerine teeth in the sea trout: the young salmon from 2½ to 3 lbs. weight has the dentition of the sea trout. Fig. 13. *a*, vomerine teeth in the full-grown salmon: the transverse vomerine teeth remain; the mesial and posterior are reduced to one or two.

sufficiently delicate I have no doubt that the principal species composing any natural family might be determined *à priori* by an inspection of the embryo and young: then and then only can Zoology be esteemed a Science.

Observations made on the proportions which the various segments of animals bear to each other, and to the corresponding structures in other animals, bear me fully out in these views.

In the fish, what may popularly be called the head includes the organs of prehension, the teeth—and of respiration, the gills. Its size, compared with the other segments of the fish, and with the same structure in other species of the same family and subfamily, will always furnish valuable information as to the character of the fish and its generic relations. The same remark applies to the fins generally; but to each after its own manner, seeing that all the fins do not belong to one system. In the table which follows are given the various measurements of three distinct species of trout.

TABLE I.

	Salmo estuarius. in.	S. Levensis. in.	S. Salar of the Tweed. in.
Total length	12 $\frac{3}{8}$	12 $\frac{1}{2}$	12 $\frac{1}{4}$
Length of head, measuring from snout to posterior margin of gill cover	2 $\frac{1}{2}$	2 $\frac{3}{8}$	3 $\frac{1}{8}$
Utmost gape		1 $\frac{1}{4}$	1 $\frac{1}{2}$
From snout to eye	$\frac{5}{8}$	$\frac{3}{4}$	1
From snout to pectoral fin	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3
Length of pectoral fin	1 $\frac{3}{4}$	1 $\frac{7}{8}$	1 $\frac{7}{8}$
From snout to dorsal fin	5 $\frac{1}{8}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$
From snout to mort fin	9 $\frac{1}{2}$	9	9
From snout to pelvic fin	5 $\frac{7}{8}$	5 $\frac{3}{4}$	6 $\frac{1}{8}$
From snout to anal fin	8 $\frac{1}{2}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$
Breadth of tail	4	3 $\frac{3}{8}$	2 $\frac{3}{4}$
From snout to end of maxillary bone	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$
Greatest depth (immediately anterior to the dorsal fin)	2 $\frac{7}{8}$ (or $\frac{1}{4}$ th of the whole length).		
Smallest (anterior to the setting on of the tail)	1		

TABLE II.—Showing the various measurements of five Estuary Trout of different lengths: they were all taken from the tideway of the Tyne, East Lothian, Scotland.

TABLE II.—Showing the various measurements of five Estuary Trout of different lengths: they were all taken from the tideway of the Tyne, East Lothian, Scotland.

VARIOUS MEASUREMENTS.									
From snout to centre of tail	14 $\frac{1}{2}$ inches.	13 inches.	13 $\frac{1}{2}$ inches.	12 $\frac{1}{2}$ inches.	11 $\frac{1}{2}$ inches.				
" to tip	14 $\frac{1}{2}$ "	13 $\frac{1}{2}$ "	13 $\frac{1}{2}$ "	12 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "				
" to suboperculum	3 $\frac{1}{8}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "				
" to anterior margin of eye	1 "	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ "				
" to end of maxillary	6 "	5 $\frac{3}{8}$ "	5 $\frac{3}{8}$ "	5 $\frac{3}{8}$ "	5 $\frac{3}{8}$ "				
" to dorsal	7 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "				
" to ventral pelvis	9 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "	8 $\frac{1}{2}$ "				
" to anal	3 "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "				
Greatest depth anterior to dorsal	11 "	11 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "				
Least depth anterior to tail	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "				
Radii branchiostegii	11 "	11 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "	11 $\frac{1}{2}$ "				
Fins.—Thoracic fin, length of	2 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "				
" number of rays	18 inches.	18 inches.	18 inches.	18 inches.	18 inches.				
Pelvic, length of	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "				
" number of rays	18 inches.	18 inches.	18 inches.	18 inches.	18 inches.				
Anal, base of	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "				
" longest ray	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "				
" number	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "				
Dorsal, base of	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "				
" longest ray	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "				
" number	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "				
Caudal, tip to tip	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "				
" depth of fork	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "				
" number of rays (each lobe)	18 inches.	18 inches.	18 inches.	18 inches.	18 inches.				
Dorsal, lateral line below	26	26	26	26	26				
" number of scales between	9 + 9 = 18	9 + 9 = 18	9 + 9 = 18	9 + 9 = 18	9 + 9 = 18				
Teeth.—Intermaxillary	18	18	18	18	18				
Vomerine	23 + 23 = 46	23 + 23 = 46	23 + 23 = 46	23 + 23 = 46	23 + 23 = 46				
Upper maxillary	12 + 12 = 24	12 + 12 = 24	12 + 12 = 24	12 + 12 = 24	12 + 12 = 24				
Palatal	20 + 20 = 40	20 + 20 = 40	20 + 20 = 40	20 + 20 = 40	20 + 20 = 40				
Lower maxillary	5 + 5 = 10	5 + 5 = 10	5 + 5 = 10	5 + 5 = 10	5 + 5 = 10				
Lingual	60	60	60	60	60				
Vertebrae, number of	60	60	60	60	60				
Cæcal apertures	1 $\frac{1}{2}$ inch.	1 $\frac{1}{2}$ inch.	1 $\frac{1}{2}$ inch.	1 $\frac{1}{2}$ inch.	1 $\frac{1}{2}$ inch.				
Length of longest cæcum	1 $\frac{1}{2}$ inch.	1 $\frac{1}{2}$ inch.	1 $\frac{1}{2}$ inch.	1 $\frac{1}{2}$ inch.	1 $\frac{1}{2}$ inch.				

The late Mr. W. Murray, of Henderland, whom I had the pleasure to call for many years my friend, informed me that occasionally a trout much resembling the species I have described was taken in the trawl-nets in Loch Fine; and this observation was confirmed by my brother, who, being engaged on the 17th January 1838, in inquiring into the herring fisheries of the Western Lochs, was present when two trout were taken in the trawl-net, off Collambray Ferry, in the Kyles of Bute. The following description of these trout I subjoin from my brother's notes: I examined them also; they seemed to me to differ somewhat from the estuary trout, but as observations respecting red-spotted trout caught in the sea are so rare, I shall not venture to offer any more decided opinion.

No. 1.—*Trout taken with two others in a trawl-net off Collambray Ferry, Kyles of Bute, on the Bute shore, January 17, 1838: that is to say, in the sea.*

Snout to centre of tail	13 inches.
„ to dorsal fin	5 $\frac{3}{8}$ „
„ to pelvis fin	6 $\frac{1}{4}$ „
„ to anal fin	8 $\frac{3}{4}$ „
„ to extreme margin of gill-cover	3 „
Length of head (dorsal line)	2 „
Greatest depth	2 $\frac{3}{4}$ „
Weight	13 oz.

“Milt not larger than a crow-quill, soft, but had evidently performed its function; when cut into, red (like the Loch Leven trout); food various, and in large quantity; pancreatic portion of intestine contained a large tape-worm and several small hard worms, &c.; spleen was triangular, not more than $\frac{5}{8}$ ths each way; liver healthy; no fatty deposit whatever in the interior.

“This trout, when first taken from the Loch, looked exactly like a river trout in very fine condition; the abdomen and fins were of a rich yellow colour. With the exception of the spots being about half the size and greatly more numerous, the general colouring of both trout was the same. As an article of food it was delicate, and resembled closely the red trout got in Loch Leven, the Tyne at East Linton, and that from the estuary of the Nith at Dumfries.”

No. 2.—*Trout taken with two others in a trawl-net off Collambray Ferry, Kyles of Bute, on the Bute shore, January 17, 1838.*

Snout to centre of tail	13 $\frac{1}{4}$ inches.
„ to dorsal fin	5 $\frac{1}{4}$ „
„ to pelvis fin	6 „
„ to anal fin	8 $\frac{1}{2}$ „
„ to extreme margin of gill-cover	2 $\frac{3}{4}$ „
Length of head (dorsal line)	2 „
Greatest depth	2 $\frac{1}{4}$ „
Weight	13 oz. 4 drs.

“Sex, female.—Ovary small, whole mass about 1 $\frac{1}{2}$ inch in length. The fish may have spawned, in all probability, last September or October early: muscle, when cut into, a bright and clear vermilion colour, like salmon.

“This trout in colour and marking was very like the preceding one; the form, however, of the body generally greatly differed. I have preserved the skin and taken a cast, which will show the difference in form, the comparative smallness of the head, and greater depth of body. The skin shows the spots on the integuments greatly larger than in No. 1, and fewer in number. This fish, as an article of food, was decidedly superior to the preceding, and I think, generally speaking, that the female trout is superior in this respect to the male, both being at the time in good condition. I am of opinion that Nos. 1 and 2 were male and female of the same species of trout, and in all probability of the same age. I have taken a plaster cast of the stomach, viscera, &c.; the contents of the stomach consisted entirely of a clear pale orange-red, shrimp-looking insect, something like those got in the stomach of the other trout, and preserved; but in this, the female trout's stomach, they seemed to be of finer quality. From the pancreatic cœca I drew out three tape-worms, similar to those found in the male trout: these worms were each about 6 inches in length.”

To sum up the specific characters of the estuary trout, I would say, that, in general colouring, it resembles the common river trout, with bright metallic tints; scales minute, adherent; head and jaws proportionally smaller than in the common river trout; muscles pink-coloured, sometimes bright red; numerous red spots above and below the lateral line; lives in brackish waters, but is sometimes found at sea; food, small shrimps.

Radii branchiostegii	11 + 11 =	22
Rays of the pectoral fins		14
„ pelvis or ventral	1 + 9 =	10
„ anal	3 + 9 =	12
„ dorsal	3 + 11 =	14
„ caudal—each lobe . 6 + 8 =	14 + 14 =	28
		100
Teeth—Intermaxillary	10 + 10 =	20
Vomerine		20
Upper maxillary	25 + 25 =	50
Palatal	14 + 14 =	28
		—
Total, upper jaw		118
Mandibular or lower jaw	20 + 20 =	40
Lingual	6 + 6 =	12
		52
General total		170

My esteemed friend and former student Mr. George Hunter, of Tynefield, and who I recollect was a first-rate angler, said that he believed he had occasionally caught these trout with a very small artificial fly and single hair tackle, from off the bank of his father's property, which skirted the estuary of the Tyne. I do not doubt this, for all the species of the Salmonidæ will occasionally rise to a fly, although it is the natural food of only some of them.

In conclusion: throughout the preceding inquiry into the natural history of the estuary trout I have used the *dentar formula* so strongly recommended by my esteemed friend M. Valenciennes, as being the one I think generally received; but I think it right to state here, that extended inquiries I have of late years made on this point have satisfied me that the view adopted by this eminent naturalist is neither practical nor scientific. The true salmon and the salmon trout, when weighing between $2\frac{1}{2}$ and 3 lbs., have precisely the same arrangement of the vomerine teeth, and cannot therefore be distinguished from each other *by this character* alone. On the other hand, as the Fario or sea trout grows larger it loses the posterior vomerine teeth just as much as does the true salmon, and thus the dentition again ceases to be a distinguishing characteristic. The young of both Salmo and Fario have the dentition of the common trout. Thus, the law of dentition applied by M. Valen-

ciennes to the three subfamilies of the Salmonidæ is a partial law, applicable probably to some Continental species, but inapplicable to the great family of the Salmonidæ as they now exist in the waters of the globe. Now, the Philosophy of Zoology, based on the Transcendental in Anatomy and Physiology, requires higher generalizations than those used by and of use to the merely practical man. A wide inquiry into the dentition of serpents taught me this fact many years ago.

R. KNOX.

Miessen House, Upper Clapton.

Memorandum of the Tadpole-Fish.—I have lately observed among the sprats brought to Billingsgate Market an occasional specimen of the tadpole fish (*Raniceps trifurcatus*). My attention was called to the subject by my son, a boy of eight, bringing me one which he had picked out from among a parcel of sprats, and this inducing me to look more carefully at the sprats exposed for sale, I am led to the conclusion that this odd-looking fish is not so excessively rare as is generally supposed; and I wish particularly to direct the attention of ichthyologists to its occasional occurrence amongst sprats. The extreme length of a specimen which I minutely examined was $5\frac{1}{8}$ inches, and its circumference close behind the insertion of the pectoral fin $4\frac{1}{4}$ inches; the length of the head to gill-opening as 1 to $3\frac{1}{4}$ of the entire length; from the tip of the nose to the tip of the pectoral fin as 1 to $2\frac{1}{3}$, or very nearly one-third of the entire length. The colour was smoky brown above, paler beneath; the skin covered with slime, as in the eel, and presenting no indication of scales, under a lens of half-an-inch focus. I mention this because the scales have been minutely described by Dr. Johnston, and I know not whether my observation proves my own inadequate power of examination, or that the scales are not present at the younger age at which my fish was taken. The number of fin-rays was as under:—

1st D. 1: 2nd D. 56: P. 20: V. 5: A. 53: C. 34:

thus in every instance being less than recorded by Pennant. The first dorsal was a slender flexible spine unaccompanied by any membrane, and the ventrals were also flexible spines of different lengths, and only partially united by membrane. When the little fish had become somewhat dry, the "pea-like tubercles" behind the pectoral fin, to which Fleming alludes as distinctive of *Raniceps* Jago, and Johnston as possessed by *Raniceps trifurcatus* after death, were very manifest both to the eye and finger. I may perhaps be pardoned for remarking with reference to the discrepancy in the number of fin-rays, that counting of them must not be considered as absolutely distinctive of specific difference, seeing that age, sex, or size of the fish, or the skill of the enumerator, may cause discrepancies such as those above noticed.—*Edward Newman.*

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

March 5, 1855.—JOHN CURTIS, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—‘*Genera des Coléoptères ou Exposé Méthodique et Critique de tous les Genres proposés jusqu’ici dans cet ordre d’Insectes*,’ par M. Th. Lacordaire, Tome ii.; presented by the Author. ‘*Bericht über die Wissenschaftlichen Leistungen im Gebiete der Entomologie während des Jahres, 1852*,’ von Dr. Herm. Schaum; by the Author. ‘*Geodephaga Britannica*,’ by J. F. Dawson, L.L.B.; by the Author. ‘*List of the Specimens of Dipterous Insects in the British Museum*,’ part 6, supp. 2, by Francis Walker; by the Author. ‘*Journal of the Royal Agricultural Society of England*,’ Vol. xv., part 2; by the Society. ‘*Proceedings of the Royal Society*,’ Vol. vii., No. 8; by the Society. ‘*Journal of the Society of Arts*’ for February; by the Society. ‘*The Literary Gazette*’ for February; by the Editor. ‘*The Athenæum*’ for February; by the Editor. ‘*The Zoologist*’ for March; by the Editor. ‘*Magazin des Thierreichs*,’ Erster Band; by John Curtis, Esq. ‘*Notes on four Galls from the Crimea*,’ by John Curtis, Esq., F.L.S. (from the *Gardeners’ Chronicle*); ‘*On the Genus Myrmica, and other indigenous Ants*,’ by John Curtis, Esq., F.L.S., and ‘*Remarks relative to the Affinities and Analogies of Natural Objects, more particularly of Hypocephalus, a Genus of Coleoptera*,’ by John Curtis, Esq., F.L.S. (both papers from the *Transactions of the Linnean Society*); all by the Author. ‘*Insecta Saundersiana; Coleoptera Curculionides*,’ by H. Jekel; by W. W. Saunders, Esq.

Exhibitions.

Mr. Stevens exhibited a quantity of insects of all orders, including several fine new species, being part of the collection made by Madame Pfeiffer, at Amboyna and Ceram. Among the butterflies were the true *Ornithoptera Priamus* ♀, *O. Panthous* and *O. Amphimedon*, Cramer. The *Lepidoptera* came packed between sheets of paper, and the other orders loose in layers between paper and cotton, not pinned; and all had travelled quite securely.

Mr. Edwin Shepherd exhibited a specimen of *Arctia Caja*, from the collection of Mr. Allis, having the left upper wing marked with two nearly parallel streaks of the same colour as the under wings, crossing the other colours of the wing from the base to the posterior margin. He likewise exhibited, from the collection of Mr. John Scott, a specimen of *Triphæna orbona*, of which the upper wings were much shortened and the colour was nearly black, the anterior margin being suffused with red. This remarkable variety was taken in Scotland.

Mr. Edward Sheppard exhibited a silken bag of a slight, flossy texture, being one of the kind imported from China as coverings to the ends of the hanks of silk in bales. Dr. Gray said he was informed by Mr. Reeves that each of these bags was only a single cocoon beaten out.

Prize Essay for 1855.

The President announced that the subject proposed for the Prize Essay of the Society this year was the Coccus producing the lac-dye of commerce, towards which, as announced last year, Dr. Royle had promised the assistance of all the information on the subject possessed by the East India Company to any one who would undertake the Essay.

Proposed Catalogue of British Coleoptera.

The Secretary stated that a proposition had been made to the Council that the Society should print a concise Catalogue of British Coleoptera, to facilitate the exchange of specimens among collectors, and thus lead to a rectification of the synonymy. The Council, although aware that at present such a list must be imperfect, were disposed to give the proposition a favourable consideration provided they were assured of support, and they invited communications on this point from Coleopterists generally.

Mr. Westwood thought, that by the united labours of our Members this desirable work might be accomplished.

Dr. Gray said he had long tried to get a Catalogue of British Coleoptera made, but in vain; he was still ready to print one, and to pay the author.

Habits of Eastern Butterflies.

Mr. Newman called the attention of the Meeting to a paper, by Mr. Wallace, 'On the Butterflies of Sarawak,' which appeared in the March number of 'The Zoologist.' The passages to which he referred were as follows:—"The handsome green and blue spotted butterflies, *Papilio Agamemnon*, &c., fly with the greatest rapidity of any *Papilios*: the eye can scarcely follow them; in fact they much resemble in habit the humming *Sphinxes*, and hover over flowers, or more frequently over damp places on the ground, with a constant vibration of the wings. * * * *Papilio Iswara*, and another species allied to *P. Helenus*, but I think new, have an undulating flight, very like that of the South American *Morphos*, or even sometimes approaching that of the large *Noctuidæ*, and they rest with the upper wings deflexed over the lower." Mr. Newman thought both these facts, the hovering like *Sphinxes*, and the resting with deflexed wings, extremely interesting: it would be within the recollection of many entomologists that Mr. Swainson and the late Mr. Edward Doubleday had urged the latter character as a reason why *Castnia* should be united to the *Sphingidæ*: with this new evidence before us, we may perhaps agree to the conclusion of these eminent Lepidopterists, but we must demur to the reasoning, because if *Castnia* were a *Sphinx* only on the ground that it possessed the character of resting with deflexed wings, then *Iswara* were a *Sphinx* also. On mentioning this subject to Mr. Adam White, the original describer of *Papilio Iswara*, and a gentleman whose entomological knowledge is all but universal, he obligingly showed Mr. Newman specimens of allied *Papilios* preserved in the matchless collection of the British Museum, with their wings in the position described by Mr. Wallace.

South African Honey-bee.

Under this title Mr. Newman read the following memorandum:—"I believe it is generally supposed that one particular species of bee is entitled to the name of 'honey-

bee,' because the only one that in this country produces honey in sufficient quantity to be serviceable to man; but there are several others. A friend, writing from the Cape, mentions a honey-bee which is even more productive than ours; he describes it as very small, scarcely half the size of *Apis mellifica*, and very fond of domiciliating in outhouses, and otherwise attaching itself to the homesteads of man. I expect to receive specimens, and shall have much pleasure in handing them to Mr. Smith for examination. Mr. Webster, in his graphic narrative of the 'Voyage of the Chanticleer,' also writes thus on visiting the farm-house of a Dutch boor:—'The first thing that attracted my attention was a swarm of bees that had attached themselves to the parlour-window, occupying the space between the shutter and the glass. On inquiring about them, I found that they had taken a liking to the situation for several years. * * * After the fear of being stung by them was got over, I contemplated the labours of these little creatures with much pleasure, and they frequently afterwards occupied my attention. They are much smaller than our bees, and appeared to be far less irritable, and I was informed that they work during the whole year. They kept the house well supplied with honey, the comb being taken away about eight times during the course of the year, or about every six weeks. The hexagonal form of the cells did not seem to be the result of pressure, and were all of the same form, both at the top and sides. In the course of my observations of them, I frequently saw them removing a portion of wax from one part of the comb to another.' These proofs of the existence of so profitable a honey-bee in the Cape Colony, appear to me very interesting. Mr. Webster's observation about the figure of the cells reminds me of an idea that I carried out three years ago: I obtained a cake of bees' wax and perforated it with circular holes as near as possible together, and afterwards, with a sharp penknife, reduced the walls to the greatest tenuity they would bear without breaking; the result was the formation of closely approximated hexagons, a good deal resembling those made by the bees; but of course much larger and much less regular: I believe the experiment was suggested by a note written years ago by Mr. Waterhouse,* but it seems to imply that the hexagonal form is almost an inevitable result of two grand objects of Nature,—economy of space, and economy of material,—and does not prove the existence of that reflecting power which some have claimed for the bee."

A new Enemy to the Honey-bee.

Under this title Mr. Newman read the following note:—

"You will probably recollect my mentioning some months back, on the authority of Mr. Lucas, a fact which I thought new, that of a fat toad squatting himself on the alighting-board of a bee-hive, watching for the bees and swallowing them one after another as they returned home at night after the labours of a long summer's day. The statement was received with evident distrust: I particularly remember our friend Mr. Hudson thought it impossible for a toad to climb to such a position, and a learned apiarian, a namesake of my own, wrote a reply showing that such an assertion was totally unworthy of serious consideration, and evidently comforted himself in believing he had totally extinguished this supposed new light in bee history. However, there is another glimmer from the same lamp, and exhibited quite incidentally and *à propos* to another anecdote. My informant is Mr. Charles Muskett, of Norwich.

9 MY 55

* Trans. Ent. Soc. III. Proceed. p. xii.

Lately Published, in cloth boards, price 12s.

A FAMILIAR INTRODUCTION TO THE HISTORY OF INSECTS.

BY EDWARD NEWMAN.

PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF LONDON,
MEMBER OF THE IMPERIAL L.-C. ACADEMY (NOMINE LATREILLE), FELLOW
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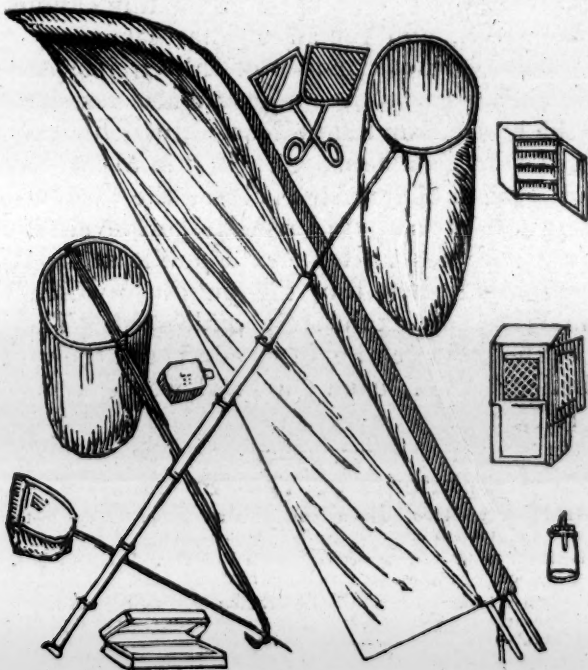
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